CLAIMS

What is claimed is:

1.   A method for suppressing noise in a source speech signal, said method comprising:

5   calculating a signal-to-noise ratio in said source speech signal;

calculating a background noise estimate for a current frame of said source speech signal based on said current frame and at least one previous frame and in accordance with said signal-to-noise ratio, wherein said calculating said signal-to-noise ratio is carried out independent from said background noise estimate for said current frame;

10   calculating an over-subtraction parameter based on said signal-to-noise ratio;

calculating a noise-floor parameter based on said signal-to-noise ratio; and

subtracting said background noise estimate from said source speech signal based on said over-subtraction parameter and said noise-floor parameter to produce a noise-reduced speech signal.

15   2.   The method of claim 1 further comprising: updating said background noise estimate at a faster rate for noise regions than for speech regions.

3.   The method of claim 2, wherein said noise regions and said speech regions are identified based on said signal-to-noise ratio.

4.   The method of claim 1, wherein said over-subtraction parameter is

20   configured to reduce distortion in noise-free signal.

5.   The method of claim 4, wherein said over-subtraction parameter is about

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zero.

6.   The method of claim 1, wherein said noise-floor parameter is configured to control noise fluctuations, level of background noise and musical noise.

7.   A noise suppressor for suppressing noise in a source speech signal, said noise suppressor comprising:

a first element configured to calculate a signal-to-noise ratio in said source speech signal;

a second element configured to calculate a background noise estimate for a current frame of said source speech signal based on said current frame and at least one previous frame and in accordance with said signal-to-noise ratio, wherein said first element calculates said signal-to-noise ratio independent from said background noise estimate for said current frame;

a third element configured to calculate an over-subtraction parameter based on said signal-to-noise ratio;

a fourth element configured to calculate a noise-floor parameter based on said signal-to-noise ratio; and

a fifth element configured to subtract said background noise estimate from said source speech signal based on said over-subtraction parameter and said noise-floor parameter to produce a noise-reduced speech signal.

8.   The noise suppressor of claim 7, wherein said background noise estimate is updated at a faster rate for noise regions than for speech regions.

9.   The noise suppressor of claim 8, wherein said noise regions and said speech regions are identified based on said signal-to-noise ratio.

10.   The noise suppressor of claim 7, wherein said over-subtraction parameter is configured to reduce distortion in noise-free signal.

5   11.   The noise suppressor of claim 10, wherein said over-subtraction parameter is about zero.

12.   The noise suppressor of claim 7, wherein said noise-floor parameter is configured to reduce noise fluctuations, level of background noise and musical noise.

13.   A computer software program stored in a computer medium for execution

10   by a processor to suppress noise in a source speech signal, said computer software program comprising:

code for calculating a signal-to-noise ratio in said source speech signal;

code for calculating a background noise estimate for a current frame of said source speech signal based on said current frame and at least one previous frame and in

15   accordance with said signal-to-noise ratio, wherein said code for calculating said signal-to-noise ratio is carried out independent from said background noise estimate for said current frame;

code for calculating an over-subtraction parameter based on said signal-to-noise ratio;

20   code for calculating a noise-floor parameter based on said signal-to-noise ratio; and

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code for subtracting said background noise estimate from said source speech signal based on said over-subtraction parameter and said noise-floor parameter to produce a noise-reduced speech signal.

14.   The computer software program of claim 13 further comprising: code for

5   updating said background noise estimate at a faster rate for noise regions than for speech regions.

15.   The computer software program of claim 14, wherein said noise regions and said speech regions are identified based on said signal-to-noise ratio.

16.   The computer software program of claim 13, wherein said over-subtraction

10   parameter is configured to reduce distortion in noise-free signal.

17.   The computer software program of claim 16, wherein said over-subtraction parameter is about zero.

18.   The computer software program of claim 13, wherein said noise-floor parameter is configured to reduce noise fluctuations, level of background noise and musical

15   noise.

19.   A method for suppressing noise in a source speech signal, said method comprising:

calculating a signal-to-noise ratio in said source speech signal;

calculating a background noise estimate for a current frame of said source speech

20   signal based on said current frame and at least one previous frame and in accordance with said signal-to-noise ratio, wherein said calculating said signal-to-noise ratio is carried out

independent from said background noise estimate for said current frame; and

subtracting said background noise estimate from said source speech signal to produce a noise-reduced speech signal.

20.   The method of claim 19 further comprising: updating said background noise estimate at a faster rate for noise regions than for speech regions.

21.   The method of claim 20, wherein said noise regions and said speech regions are identified based on said signal-to-noise ratio.

22.   The method of claim 19 further comprising: calculating an over-subtraction parameter based on said signal-to-noise ratio.

23.   The method of claim 22, wherein said over-subtraction parameter is configured to reduce distortion in noise-free signal.

24.   The method of claim 22 wherein said over-subtraction parameter is less than one.

25.   The method of claim 19 further comprising: calculating a noise-floor parameter based on said signal-to-noise ratio.

26.   The method of claim 25, wherein said noise-floor parameter is configured to reduce noise fluctuations, level of background noise and musical noise.